MISSION OPERATIONS DIRECTORATE
FLIGHT DIRECTOR OFFICE

STS-102/5A.1 MISSION SUMMARY

FLIGHT READINESS REVIEW

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STS-102/5A.1 Shuttle Overview

- **OV-103 – Discovery**
- **Crew – Up: 6 US, 1 Russian**
  Down: 5 US, 2 Russian
- **Mission Duration 12+0+2**
- **6 N2 tanks**
- **5 Cryo Tanks sets**
  - **Cryo margins positive for 12+0+2 mission with 96+ hours pad hold.**
- **2 Planned EVAs**
- **Propellant acceptable. Fwd ~ 600 #, Aft ~ 1450# margin.**
- **Shuttle reboost planned. Exact altitude increase is TBD.**

STS-102/5A.1 Mission Summary

- **Four primary objectives for STS-102, in priority order:**
  - **1.) Crew rotation**
    - **Crew equipment stowage, handover, familiarization**
  - **2.) Preparation for SSRMS arrival on 6A**
    - **Placement of Lab Cradle Assembly (LCA) on Lab keel trunnion**
    - **Installation and connection of Rigid Umbilical (RU)**
    - **Move PMA 3 from Node Nadir to Node Port CBM**
    - **Install and checkout Robotics workstations (MSS) / Power racks in the Lab (DDCU)**
  - **3.) Outfit of U.S. Lab / Resupply**
    - **Ku band capability (Av Rack 3)**
    - **CHeCs, HRF**
    - **Resupply Stowage Racks, Resupply Stowage Platforms**
  - **4.) Delivery of on-orbit spares**
    - **External Stowage Platform (ESP)**
    - **Pump Flow Control System (PFCS)**
    - **CDRA Vacuum Pump and cables**

STS-102/5A.1 Critical Activities

To preserve the assembly sequence, 5A.1 must rotate crew and prepare ISS to receive SSRMS on 6A.

Activities required:

- **Rendezvous/dock**
- **Rotate crew (including Soyuz seat and med kit)**
- **Install LCA/RU (EVA 1)**
- **Move PMA 3 to Node Port**
- **Berth MPLM and remove /install MSS and DDCU racks**
- **Remove MPLM**

This mission would require a minimum of 7 days (4 docked)

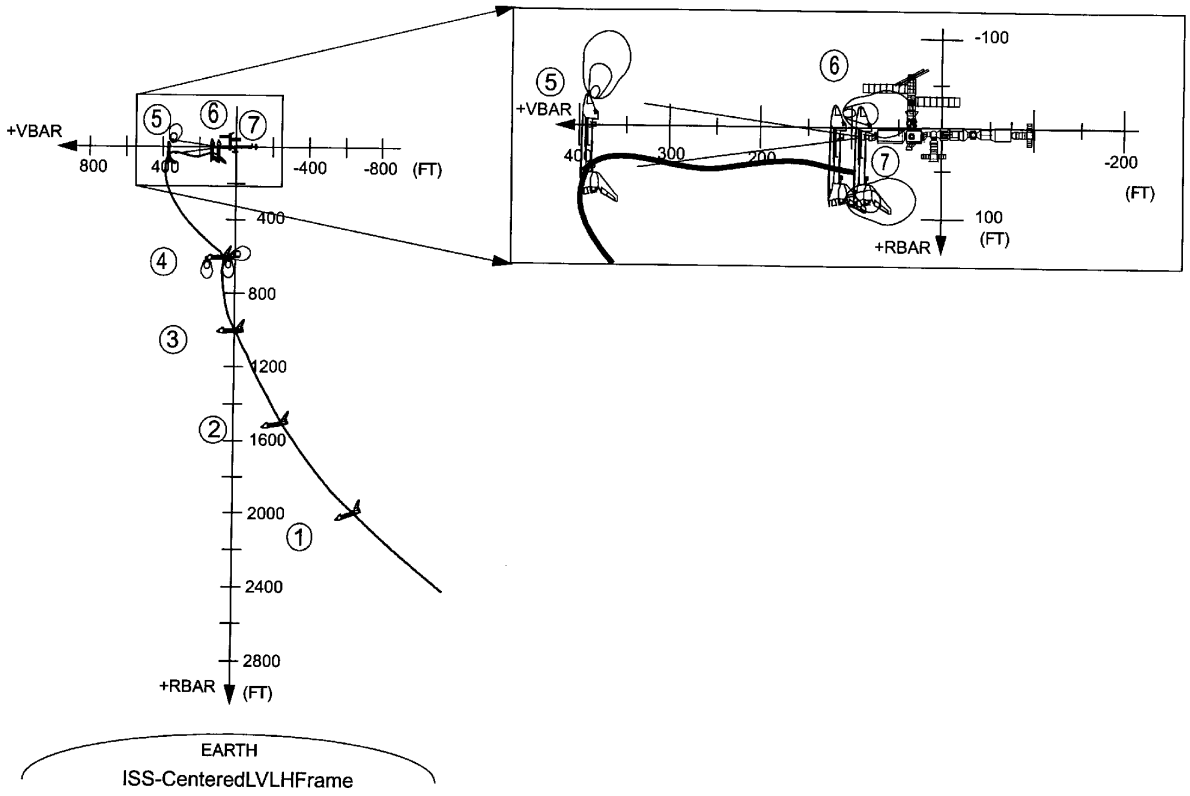
5A.1 Mission Overview

- **FD1**
  - **Launch – first direct insertion to 122 NM apogee**
  - **Activate APCUs / MPLM**
- **FD2**
  - **Activate and checkout OIUs**
  - **SRMS Checkout**
  - **Cargo visual inspection with SRMS**
  - **EMU checkout**
  - **Activate and checkout Orbiter Docking System**
  - **OSVS Checkout**
  - **Rendezvous prep**

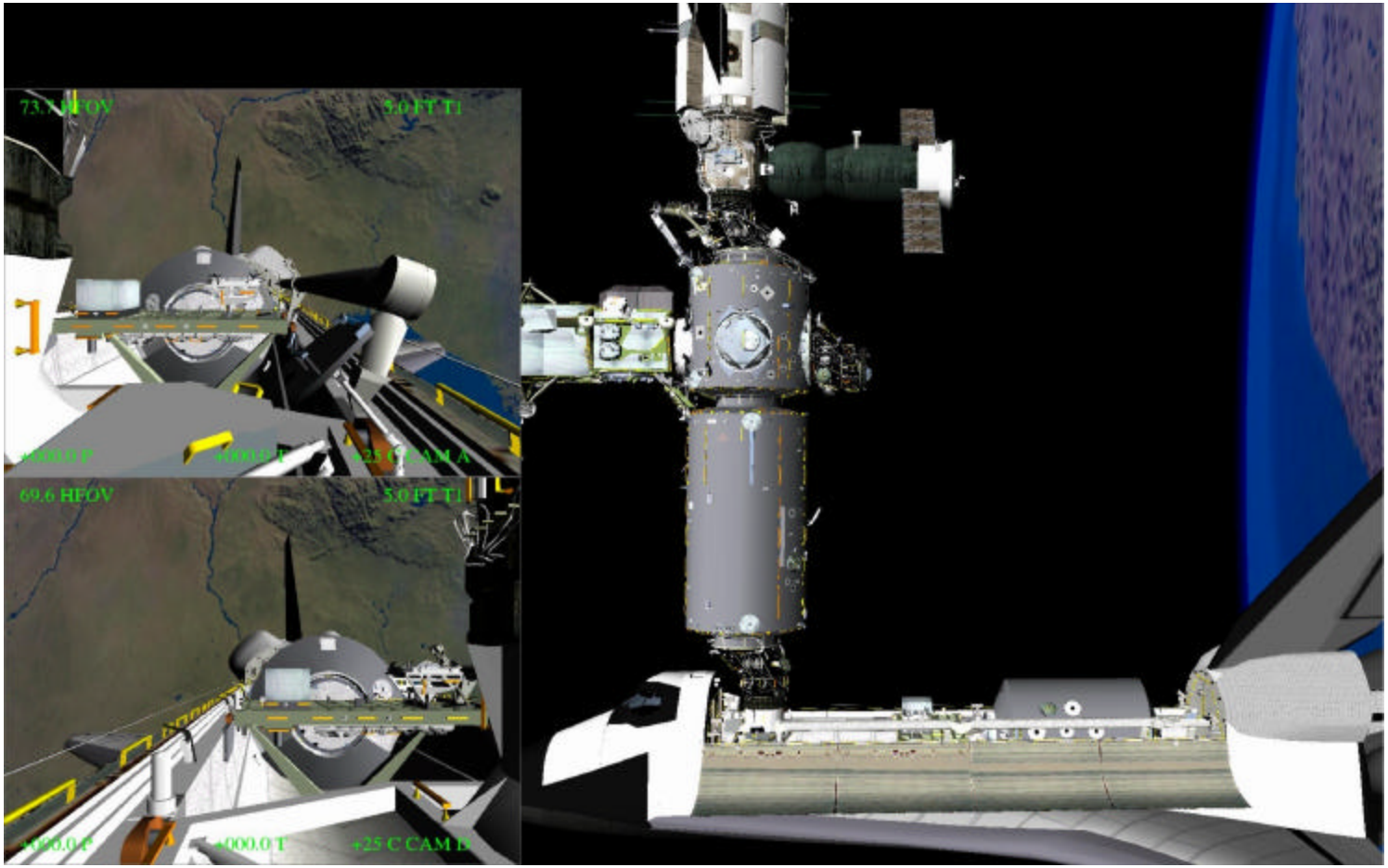
5A.1 Mission Overview (cont.)

- **FD3**
  - **ISS Maneuver to Docking Attitude**
  - **ISS Feather Solar Arrays for Docking (P6, FGB, SM)**
  - **Perform first +Vbar ISS rendezvous**
  - **Dock Orbiter to PMA2**
  - **Shuttle crew ingress ISS**
  - **Welcome Ceremony**
  - **Early transfer of 2 SAFERs, 3rd EMU, temp stow IELK's in Node**
  - **Rotate Usachev/Gidzenko (Install seat, suit check)**
  - **Shuttle crew egress ISS**
  - **Close hatches, depress Shuttle to 10.2 psi.**

5A.1 Docking to ISS



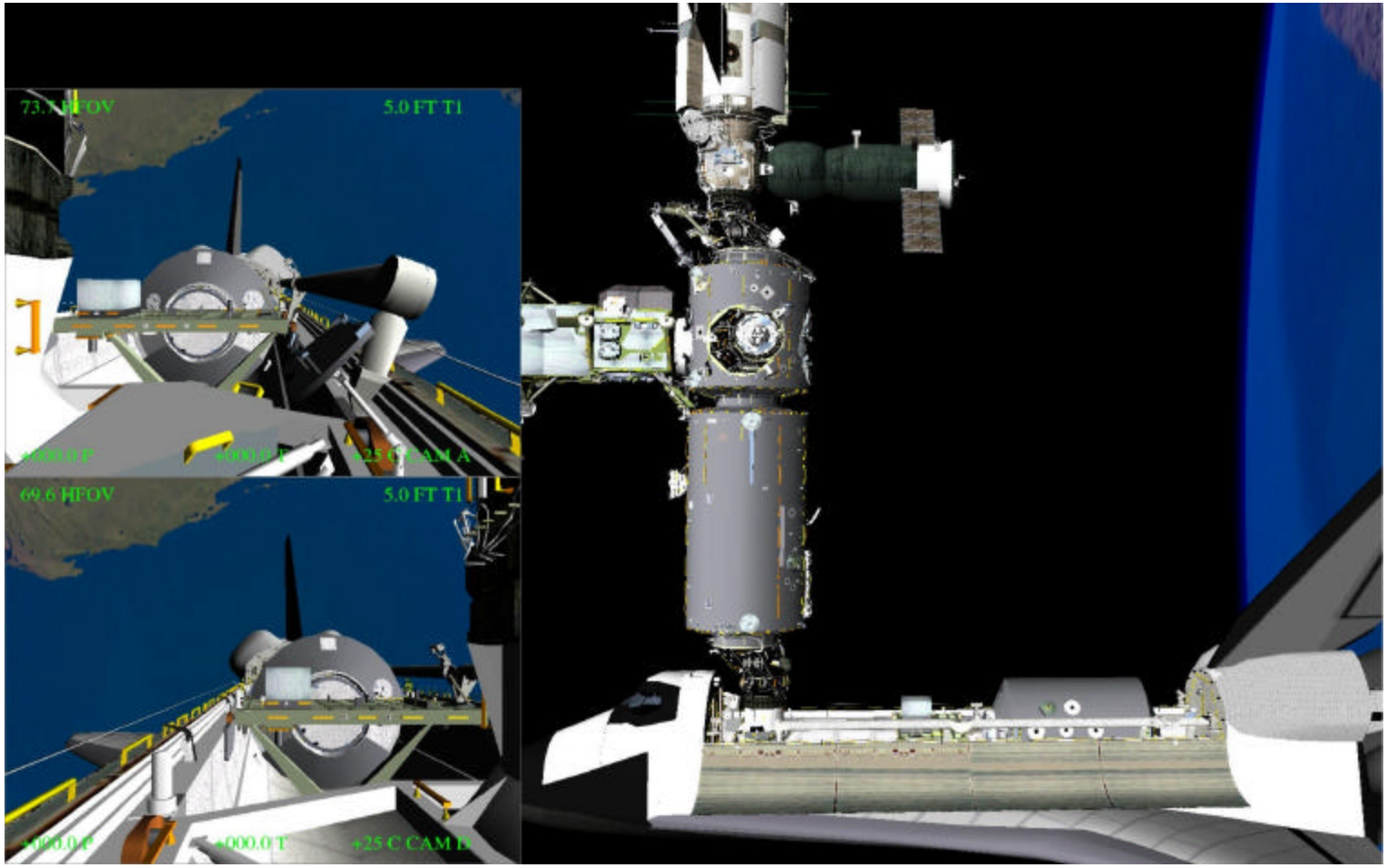
5A.1 Initial Configuration



5A.1 Mission Overview (cont.)

- **FD4**
  - **ISS crew – Handover activities**
  - **EVA 1**
    - **Disconnect/stow PMA 3 to Node Umbilicals**
    - **Remove Node Port Early Comm antenna**
    - **Reposition Gap Spanner to PMA 3**
    - **Transfer/Install Lab Cradle Assembly + heater**
    - **Install Rigid umbilical on Lab**
    - **Connect Rigid Umbilical to PDGF**
  - **Relocate PMA3 to Node Port using SRMS**
    - **Use Space Vision System (SVS) two-camera solution, RMS digital data, and EVA crew visual verification if required (2 of 3 highly desirable)**
  - **Orbiter 14.7 psi Repress**

5A.1 after EVA 1/PMA 3 Move

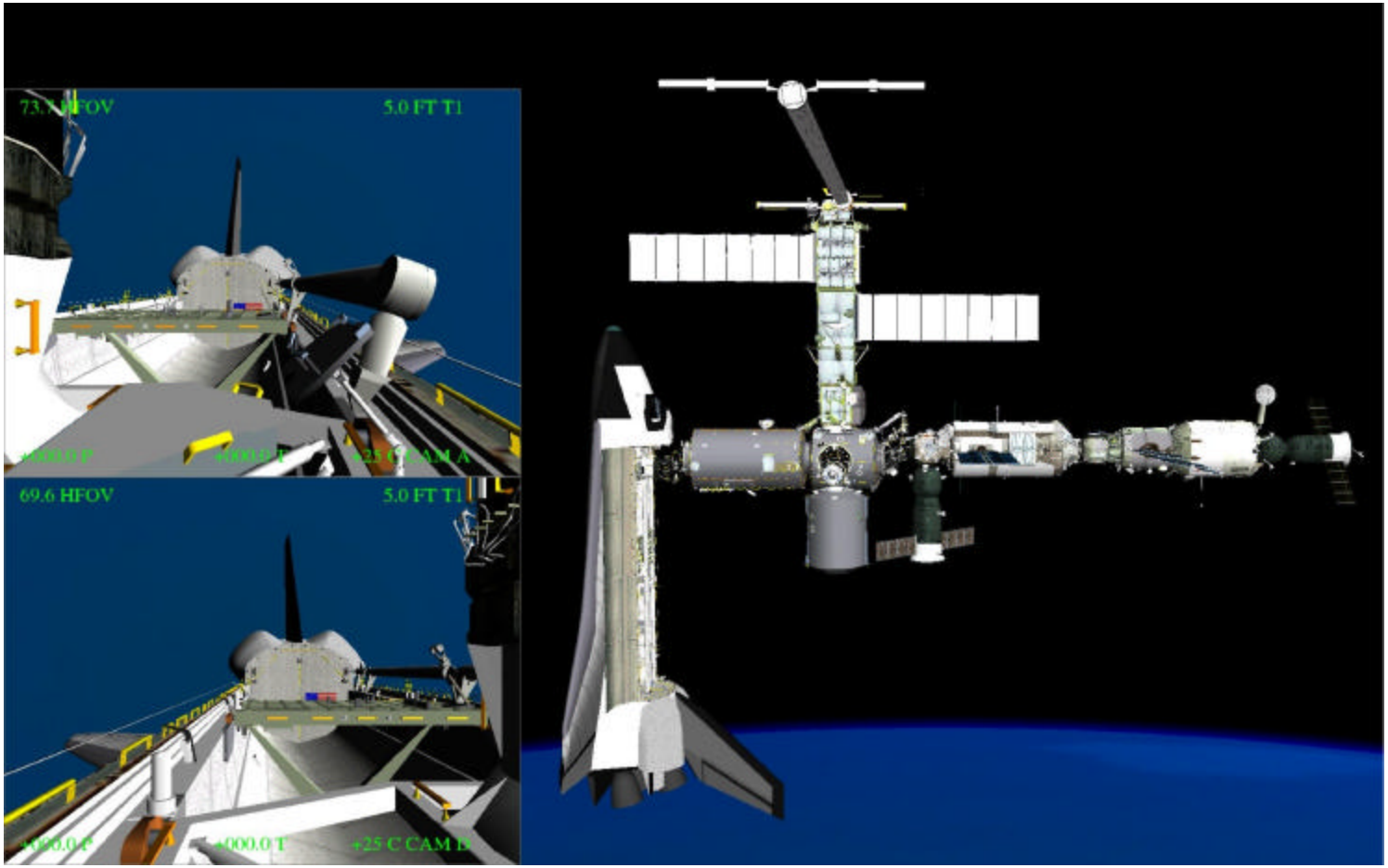


5A.1 Mission Overview (cont.)

- **FD5**
  - **Open Hatches**
  - **Set up Centerline Berthing Camera System and SVS**
  - **Install MPLM on Node Nadir using SRMS**
  - **Rotate Voss/Krikalev (Install seat, suit check)**
  - **ISS crew performs MPLM vestibule outfitting/MPLM activation**
  - **Close hatches, 10.2 depress**

- **FD6**
  - **ISS crew performs rack transfers (DDCU 1 and 2 first)**
  - **Shuttle crew EVA #2**
    - **Install External Stowage Platform (ESP) on LAB**
    - **Install Pump Flow Control System (PFCS) on ESP**
    - **Rotate Circuit Interrupt Devices (CIDs) to power DDCUs**
  - **Repress to 14.7, open hatches**

5A.1 after MPLM Mate/EVA 2



5A.1 Mission Overview (cont.)

- **FD7**
  - **Rotate Helms/Shepard (Install seat, suit check)**
  - **Transfer HRF rack**
  - **Both crews: soft-stow transfer, handover**

- **FD8, FD9**
  - **Transfers, crew handover, configure return cargo in MPLM**

- **FD10**
  - **MPLM Vestibule Deoutfitting, depress, leak checks**
  - **MPLM stow in Orbiter Payload Bay**
  - **Crew conference**

5A.1 Mission Overview (cont.)

- **FD11**
  - **Close Hatches**
  - **Undock from PMA2, Flyaround, Separate**
  - **Off duty for second half of day**

- **FD 12**
  - **FCS C/O, RCS Hot-fire, Cabin Stow**

- **FD13**
  - **Recumbent Seat Installation**
  - **D/O Prep**
  - **Landing 11/18:52**

Undock/Flyaround sequence